trapped. Fig. 26 shows another vessel 207 having two inlet ports 41, 45 and one outlet port 43. Inlet channels 50, 54 connect the respective inlet ports 41, 45 to the chamber 42, and outlet channel 52 connects the chamber 42 to outlet port 43. Many other different embodiments of the vessel are also possible. In each embodiment, it is desirable to evacuate the chamber 42 from the highest point (with respect to gravity) in the chamber and to introduce liquid into the chamber from a lower point.

Please replace the paragraph beginning on page 30, line 17 with the following paragraph:

Figs. 15A-15B illustrate two types of valves used in the cartridge. As shown in Fig. 15A, there are two types of fundamental concepts to the valve action, and hence two types of valves. The first valve uses a cone-shaped or conical valve seat 160 formed in the middle cartridge piece 24. The valve seat 160 is a depression, recess, or cavity molded or machined in the middle piece 24. The valve seat 160 is in fluid communication with a chamber 167 through a port or channel 157 that intersects the center of the conical valve seat 160. As shown in Fig. 15B, a valve actuator 164A having a spherical surface is forced against the elastic membrane 63 and into the valve seat 160, establishing a circular ring of contact between the membrane 63 and the valve seat 160. The kinematic principle is that of a ball seated into a cone. The circular seal formed by the membrane 63 and valve seat 160 prevents flow between the channel 157 (and hence the chamber 167) and a side channel 158 extending from a side of the valve seat 160. The side channel 158 is defined by the membrane 63 and the middle cartridge piece 24.

Please replace the paragraph beginning on page 34, line 29 with the following paragraph:

A conical valve seat 160 (previously described with reference to Figs. 15A-15B) is formed in the middle cartridge piece 24 below the chamber 414 to control the flow of liquid between the chamber 414 and a connecting channel 411. The valve is opened and closed by a valve actuator 186 having a flange 187 and a spring 188 pressing against the flange 187 to hold the valve closed until a downward force is applied to the actuator 186. The downward force is preferably supplied by a solenoid that pulls down

a3

the actuator 186 to open the valve. The valve actuator 186 and solenoid are preferably located in the instrument.

Please replace the paragraph beginning on page 45 line 17 with the following paragraph:

a4

--Fig. 34 shows a partially cut-away, isometric view of the chamber of the vessel inserted between the plates 190A, 190B (the top portion of the vessel is cut away). The vessel preferably has an angled bottom portion (e.g., triangular) formed by the optically transmissive side walls 57A, 57B. Each of the plates 190A, 190B has a correspondingly shaped bottom portion. The bottom portion of the first plate 190A has a first bottom edge 250A and a second bottom edge 250B. Similarly, the bottom portion of the second plate 190B has a first bottom edge 252A and a second bottom edge 252B. The first and second bottom edges of each plate are preferably angularly offset from each other by the same angle that the side walls 57A, 57B are offset from each other (e.g., 90°). Additionally, the plates 190A, 190B are preferably positioned to receive the chamber of the vessel between them such that the first side wall 57A is positioned substantially adjacent and parallel to each of the first bottom edges 250A, 252A and such that the second side wall 57B is positioned substantially adjacent and parallel to each of the second bottom edges 250B, 252B. This arrangement provides for easy optical access to the optically transmissive side walls 57A, 57B and hence to the chamber of the vessel. A gel or fluid may optionally be used to establish or improve optical communication between each optics assembly and the side walls 57A, 57B. The gel or fluid should have a refractive index close to the refractive indexes of the elements that it is coupling.

Please replace the paragraph beginning on page 59 line 30 with the following paragraph:

a5

Following priming, valve 115 and pressure port 116 are closed and valves 107 and 114 are opened. At the same time, a pressure of 20 psi is applied to the sample chamber 65 through the pressure port 105 for about 15 seconds to force the sample to flow through the channel 106, through the filter stack 87 in the chamber 86, through the channels 110, 111, 112 and into the vented waste chamber 68. As the sample passes the

detection region 136 in the channel 106, the reflective optical sensor 144 (Fig. 13) may be used to determine when the sample chamber 65 has been emptied. As the sample liquid flows through the filter stack 87, target cells or viruses in the sample are captured. When a predetermined volume of sample reaches the waste chamber 68, some of the liquid spills over into the sensor chamber 120, triggering the next step in the protocol. Alternatively, instead of using feedback from optical sensors to trigger events, the steps in a predetermined protocol may simply be timed, e.g., applying predetermined pressures for predetermined durations of time to move known volumes of fluid at known flow rates.

a5

IN THE CLAIMS:

Please cancel claims 1-21 and replace with claims 22-42 as follows:

22. A device for conducting a chemical reaction, the device comprising:
   a) a body having at least first and second channels formed therein; and
   b) a reaction vessel extending from the body, the reaction vessel having:
      i) a reaction chamber;
      ii) an inlet port connected to the reaction chamber via an inlet channel; and
      iii) an outlet port connected to the reaction chamber via an outlet channel;

   wherein the inlet port of the vessel is connected to the first channel in the body and wherein the outlet port of the vessel is connected to the second channel in the body.

a6

23. The device of claim 22, wherein the body further includes a vent in fluid communication with the second channel for venting gas from the second channel.